HOW TO BATHE

BY

E. P. MILLER M. D.

HOW TO BATHE:

A

FAMILY GUIDE

FOR THE USE OF WATER IN PRESERVING HEALTH AND TREATING DISEASE.

BY

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PREFACE.

WATER as a health-preserving and remedial agent is fast growing in popular favor; it would have been far more popular if the mass of the people had possessed a true knowledge of the art of applying it. In many cases where it has been used it has failed of good results for want of such knowledge.

This little work is designed as a hand-book or family guide, to explain the best methods of making the different water applications, and make known the principles upon which they depend. It should not be merely glanced at and then laid aside to be consulted only in cases of sickness, but should be carefully studied till the minutiæ of the different processes are familiar to all—upon mothers and nurses in particular, is this especially enjoined.

There is no subject of more importance than health, and no agent has a greater influence either in its preservation or restoration, than water. Let this fact be once established in

the minds of the people, let them realize that Natural Agents are the most efficient preservers of health, and when rightly used are equally efficient in removing disease, and a new era will have dawned in which health shall be the rule and disease the exception, instead of the opposite condition which now so universally obtains.

NEW YORK, 1869. E. P. M.

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WATER.

I BLESS God every day for water; for the pure, soft, sparkling water. Who does not love it as it glistens in the dewdrop, sparkles in the fountain, or gurgles in the wayside rill? Who but listens with delight to its patter on the roof, its dripping from the trees, and its murmur in the pebbly brook? Who, unmoved, unawed, can watch it rushing over rocky beds of rapid rivers, madly dashing down the mighty cataract, spreading out clear and placid in the silver lake, or slowly, yet unfailingly, rising and falling in the majesty of the boundless and illimitable sea?

It is an emblem of beauty, purity, and truth. It is abundant everywhere. More than three-fourths of the surface of the earth is covered with water, in one vast body, and the remaining one-fourth is everywhere dotted with lakes, and rivers, and creeks, and rivulets, and springs; and if we penetrate below the surface, in almost any place, it comes boiling up in wells.

Every tree, shrub, bush, plant, flower, and blade of grass that grows, has more than one-half of its solid substance composed of water. They suck it up from the soil, they drink it in from the rain, they absorb it from the dews, and when deprived of it they die.

It is equally essential to animal life. Not a wild beast roams the forests, or worm or insect crawls upon the ground,

or domestic animal plucks the grass of the field, not a bird that flies, or fish that swims, whose bodily structure is not more than two-thirds water.

It is, too, the most abundant element in the structure of man, about seventy-five per cent. of the human body being water. Thus a man weighing one hundred and fifty-four pounds, comprises one hundred and sixteen pounds of water and only thirty-eight pounds of dry matter. Eighty per cent. of the blood, and seventy-four per cent. of the flesh is water, and this element also forms about one-eighth of the dry bones. It is present during all periods of life, being found even in the ovum.

Life could be longer sustained without food than without water. The daily average quantity of food required for a full-grown man is two and one-half pounds, while, in the same time he takes three and one-half pounds of water. A large proportion of the solid food is composed of water.

Water is the natural drink of all animals, and is the medium employed for dissolving and digesting the food and distributing it to the different parts of the body. It gives to the body its smoothness, its roundness, and its symmetry of form, its pliability and ease of motion, and its adaptability to the various purposes of life. No function of the various organs of any animal could be performed without it. It gives to the brain its power to think and feel, to the heart its power to circulate the blood, to the muscles power to contract, to cartilage its elasticity, to tendons their pliability and toughness, and to bones their strength and power of resistance.

And how essential is this element to our daily wants. In the preparation of food, in the cleansing of clothes and dwellings, in all the household minutiæ, water is the one thing which can not be dispensed with. Who does not know, too, how the summer shower purifies the air of its noxious vapors rendering it so sweet and refreshing to breathe, baptizing trees and plants, and giving new life and animation to every

thing it touches? Even the cattle on a thousand hills are made happier and fresher by the falling rain.

How grateful ought we to be to the Creator for this inestimable gift, and how careful to make a right use of it. When properly used it is one of the most important agents in preserving health, treating the sick, and prolonging life.

Water is indispensable to the life, health, and happiness of man not only in this world, but Scripture teaches that it is equally essential to his future life and eternal happiness. "Except a man be born of water, and of the spirit, he can not enter into the kingdom of God." Baptism is an essential rite in every Christian church, and may mean something more than sprinkling, pouring, or immersing once in a lifetime. "Water, properly applied inside and outside of a man, has more regenerating grace in it than most people are aware of." Cleanliness is not only next to Godliness, but is a stepping-stone to help a person up into Godliness.

Those persons who bathe often, and are cleanly in all their habits, are generally moral and virtuous. Thieves, liars, pickpockets, drunkards, and gluttons seldom bathe. Health, cleanliness, temperance, goodness, and virtue are associates. Disease, filth, gluttony, vice, and crime seek the same haunts. Christ healed the diseases of all whose sins he forgave. Diseases and devils were cast out at the same time, by the same power. That man is not a very good Christian who never bathes, and he who takes a daily bath is not generally a very great sinner.

PROPERTIES OF WATER.

Water is formed of two gases, Oxygen and Hydrogen, combined in the proportion, by weight, of eight parts of the former to one of the latter; by measure, two parts hydrogen to one of oxygen. This peculiar combination is a very important circumstance in the relation of this element to organic life. All plants and animals contain these same constituents in

large proportions, and, for their growth, require a constant supply of oxygen and hydrogen. Water is everywhere present to furnish these necessary ingredients which no other liquid can as well supply, and thus it becomes not merely a drink but a part of the food.

Pure water is colorless, tasteless, and inodorous—a wise provision of Nature for the comfort and health of men and animals. Sweet odors and pleasant savors are at times enjoyed, but constantly present, are extremely injurious to health. Hence water and air, which have to enter so often into the body and penetrate to the most delicate parts, are made so destitute of sensible properties that they can come and go to any part of the form without being perceived. "Noiselessly they glide over the most tender nerves, and may make a thousand visits to the extremest parts of the body without producing the most momentary irritation or sense of pain."

WATER AS A SOLVENT.

A solvent is any substance which will dissolve another and hold it in solution. Water has a more extensive solvent power than any other substance in nature. This solvent power of water accounts for the readiness with which it assumes so many unnatural properties, becoming either sweet, sour, bitter, astringent, salt, nauseous, or poisonous, according as it has come in contact with substances possessing these properties. It readily dissolves and washes out of the soil various substances, such as chloride of sodium, bromine, potassium, sodium, magnesium, aluminium, lithium, lime, iron, sulphur, etc. Water performs a similar service when taken into the human system; it dissolves the various salts, chemical substances, gases, waste matter, and excrementitious materials, and washes them out through the kidneys, the bowels, the skin, and the lungs. It is thus the body is rid of impurities and kept in a healthy condition.

ABSORBING POWER OF WATER.

The absorbing power of water enables it to hold in solution the various substances which it dissolves. It absorbs various gases, not only when in contact with them but even when separated by a porous substance; this takes place inside the body as well as out of it. The falling rain absorbs the noxious gases from the air and leaves it pure for respiration. Water absorbs the bitter and noxious principles of plants, and thus are formed many of the agents used for medicinal purposes.

Water will absorb more heat than an equal bulk of almost any other substance. In its natural state, it is a liquid; but by the application of heat it is changed to a gaseous body, while the withdrawal of heat converts it into a solid. In the varying degrees of temperature which it can be readily made to assume consists one of its valuable powers as a remedial agent.

PURE WATER.

The purer the water used for mechanical or chemical purposes, or for bathing, drinking, or cooking, the better. Pure water is the most perfect solvent, and the best absorbent. Pure water is always soft, but soft water is not always pure. The water of swamps and cisterns is soft, but seldom pure. Water is hard, only when it holds in solution mineral substances; but animal, vegetable, or mineral matters render it alike impure. Water is nowhere found absolutely pure, and can be made so only by distillation. According to analyses, the purest water is rain as it falls from the clouds; then, in order, creeks and rivers, soft-water springs and wells, fresh-water lakes, hard-water springs and wells, mineral springs, sea water, and, lastly, the Great Salt Lake, the Caspian and the Dead Sea.

IMPURITIES OF WATER.

Water is rendered impure from three causes: First, by absorbing in its passage from the clouds noxious gases and particles of dust from the atmosphere ; Second, by absorbing the various decayed animal and vegetable substances with which it comes in contact; Third, by dissolving and washing out various salts and mineral matters from the soil and rocks.

The purest water is obtained at a distance from large towns, during the latter portion of a heavy shower, after the impurities in the air have been in a measure removed by the falling rain. Rain water, collected in cisterns, is rendered still further impure by the soot, cinders, ashes, and dust from chimneys, roofs, and gutters. Creeks and rivers always contain more or less of decayed vegetable matter absorbed from forests, swamps, and fields, and of animal excrements and impurities from yards, houses, and out-buildings, besides the mineral constituents of the soil. The large proportion of rain water they contain, however, keeps them comparatively soft.

Stagnant water often contains minute animalculæ which may be readily seen with a microscope, and which are poisonous to the human system.

HARD WATER.

Water is made hard by washing from the soil the sulphate and carbonate of lime, and ought not to be used for bathing, drinking, or cooking when soft water can be obtained.

When water contains much lime it is often bright and sparkling, and is quite agreeable to the taste ; but observing its milky appearance when boiling, and the thick coating it leaves upon kettles and boilers, one can imagine its effects when brought in contact with delicate mucous membranes or exhaled through the lungs and skin. Its application

renders the skin dry and rough, causes the hands to chap, and, taken internally, produces similar results on the lining membranes, and often causes calcareous deposits in the liver, kidneys, and bladder. It is decidedly unfavorable to persons troubled with diseases of these organs, and to those suffering from dyspepsia or inclined to consumption.

Its injurious effects upon the animal system are observed in the horse. Youatt states that "hard water, drawn fresh from the well, will assuredly make the coat of a horse unaccustomed to it stare, and it will not infrequently gripe and otherwise injure him."

The water of wells, in addition to the lime and other mineral substances, often contains the washings from dwellings, yards, cemeteries, cesspools, and sewers, rendering it very impure and unwholesome. In large towns and cities supplied by wells, serious and fatal diseases, such as diarrhea, bloody dysentery, and putrid fevers, are often engendered from this cause. In such places, water brought from a distance in iron pipes is far preferable.

MINERAL WATERS.

Mineral waters are those which contain mineral elements in large quantities, and hence are very impure. The majority of mineral springs contain a large proportion of saline substances, and are called Saline springs. Some springs abound in carbonate and sulphate of iron, and are termed Chalybeate or Ferruginous springs. Others abound in sulphur, and are denoted Sulphur springs. Those springs whose waters are brisk, and peculiarly sparkling, contain carbonic acid gas, and are called Carbonated or Acidulous waters. Other springs contain magnesium, potassium, aluminium, sodium, lithium, and various other constituents.

The waters of the celebrated Congress Spring at Saratoga are probably the most widely known of any in this country. This water is drank by thousands for its medicinal properties.

It contains, according to analysis, in each gallon about four hundred grains of chloride of sodium or common salt, nearly as many of carbonic acid, and over one hundred grains each of carbonate of magnesia and lime, and several other substances in small proportion. That many persons are benefited by using these waters there is no doubt, but if they would combine the same amount of relaxation from business, with the out-door life and varied amusements, and drink as freely of pure soft water, much more benefit might result. Sea water contains the mineral properties of all the mineral springs, and a less quantity would produce results similar to those produced by mineral waters.

LEAD POISONS.

Water passing through lead pipes or gutters, flowing over leaden roofs, or kept in leaden tanks and cisterns, becomes so impregnated with the metal as to render it not only impure but positively poisonous. Diseases known as lead or painter's colic and lead palsy or paralysis are often produced by this cause and frequently result in death. The use of pails and tubs painted on the inside for water, milk, or sap, ought, for this reason, to be avoided. Water standing in vessels with leaden covers will evaporate and, condensing on the lower surface of the covers, fall back into the water, poisoning the entire mass. The softest and purest waters are the most liable to become impregnated with this poison, as water containing lime, soda, saline matters, and other earthy salts, forms a coating upon the lead surface preventing its corrosion.

Even soft water, if allowed to remain undisturbed for several months in lead pipes, cisterns, or tanks, forms a crystalline deposit of carbonate of lead which attaches itself to the surface of the vessel whereby further action is prevented. A weak solution of the phosphate of soda (one grain to five and one-half pints of water) also prevents corrosion.

Lead and iron, or lead and zinc, brought in contact, as in pumps or in supports for the covers of cisterns, produce galvanic action which facilitates the corroding of the lead, increasing the liability to poisoning. Wood, cast or wrought iron, stone, or cement is preferable to lead for conducting water. A process has been recently invented, however, by which lead pipe may be covered, inside and out, by a coating of tin, rendering it comparatively safe. This article is known as block-tin pipe.

To ascertain if water is poisoned with lead, expose a quantity of it to the air for a time, and if a thin white film rises upon it, or if the sides of the vessel become lined with a thin white incrustation of a pearly luster, lead poison may be suspected. Dissolve this crust or film in acetic acid, and if it turns brown or blackish by the application of sulphuretted hydrogen, or yellow by the application of chloride of potassium or bicarbonate of potash, it may be safely announced as lead poison.

Water which will leave a stain upon lead when left to rest upon it for a few hours, can not be safely conducted through lead pipes without certain precautions.

HOW TO PURIFY WATER.

Distillation is the most perfect method of purifying water, but this process is much too slow and expensive for ordinary use. The chemist finds distilled water absolutely necessary for the various purposes of his laboratory, and to the druggist it is equally indispensable in the preparation of his compounds, but small quantities only being required, it is readily obtained by boiling water in one vessel and condensing the vapor in another.

Those who have a supply of soft water from springs, wells, or mountain brooks, need make no further provision; but those depending upon cisterns should take certain precautions. The cisterns should be large, made of cement, and

placed under ground to render them cool. The water should be passed through a large filter of charcoal, coarse sand, and gravel as it enters the cistern, and through a smaller filter of similar construction as it is drawn for use. Water from streams should be filtered, when used for drinking or cooking. Filtering will not make hard water soft, nor take out mineral impurities, but it removes the vegetable and animal impurities and thus improves it for use. The filters should be occasionally removed and cleansed, as they retain the impurities extracted from the water.

Hard water is made softer by boiling, the lime being precipitated upon the sides of the vessel. Boiling also expels the noxious gases, destroys all animal and vegetable parasites, and removes or coagulates organic matter. Alum will cleanse turbid or muddy water—two or three grains to the quart effecting the purpose—but renders it harder than before. The water of the Seine used in Paris is thus cleansed. Potash or soda will make hard water soft, but they do not improve it for use. Chips of oak wood, or tannin of oak bark put into water containing organic impurities will cleanse it by causing these impurities to sink to the bottom.

MEDICINES.

Medicines are arranged in classes according to the peculiar effects produced by them when taken into the system. For instance, all substances which induce nausea and vomiting are termed Emetics; those which produce a mild action of the bowels are called Laxatives; those which excite a more violent action of the bowels are called Cathartics or Purgatives; medicines which cause a free action of the kidneys are termed Diuretics; those which produce perspiration are called Diaphoretics. Stimulants are those agents which excite the brain and nerves, and increase the circulation, while Sedatives depress the action of these organs. Cholagogues excite action in the liver; Emmenagogues, in the womb; Anthel-

mintics or Vermifuges destroy worms or parasites; and in this way the whole *materia medica* is divided into classes.

It has been supposed that these various substances possessed some peculiar affinity for or mysterious unexplainable power to act upon the organs which they thus influence, and, therefore, were destined by Nature as remedies for disease.

The true explanation of the *modus operandi* of medicines doubtless is this: They are nearly all poisons, and for this reason are more or less obnoxious to the living tissues; hence, the different organs are aroused to various modes of action to get rid of them. For example, Emetics irritate the stomach and are forcibly ejected by vomiting; Cathartics excite a copious secretion of fluids from the bowels, and are washed out by purging or diarrhea; Diuretics are most easily carried out through the kidneys, in the urine; Diaphoretics, through the skin, in the perspiration; and so on through the several classes, the vital forces are excited to action in various ways to ward off the deleterious influences which are occasioned by their use. In spite of the efforts to expel them, however, more or less must be absorbed and taken into the circulation, impairing the blood and interfering with the vital processes.

If people generally had correct ideas of the effects of medicines, they would resort to their use much less frequently than they now do. In the present condition of society, they may be necessary in some cases, but, like the surgeon's amputating knife, should be used only in cases of necessity, and after other and less harmful means have been ineffectually employed.

Because the amputating knife is in some cases a necessity, it does not follow that it should be used for every bruised limb or broken bone! Neither does it follow that because medicines may in some cases be a sensible choice of two evils, they are to be used for every ailment to which the human family is subject.

EFFECTS OF WATER.

The human body is constantly undergoing changes. We are not the same to-day that we were yesterday. To-morrow will find us different from to-day. The tissues that supply power for the use of our muscles and brains to-day, will to-morrow become useless and worn-out material. Every action, every thought, feeling, or emotion consumes the vital force of certain particles of body and brain, rendering them useless, and as dead matter they are taken into the circulation and expelled from the body through the skin, the bowels, the kidneys, and the lungs. New tissues are constantly being formed to supply the place of this dead matter, the materials for which are obtained from the blood, and have been produced by the digestion of fresh supplies of food. The process of tissue formation is called assimilation. Water is the agent by means of which our food is digested, and the nutrient portion carried to the various parts of the body, for the formation of new tissues. A daily supply of pure water, wholesome food, and fresh air, with proper exercise, is indispensable to keep the body in a healthy condition.

It is equally important that the worn-out material and waste matter should be removed from the body as fast as it accumulates. If our stoves or grates become choked with ashes and cinders the fires burn dimly, and though we may add fresh supplies of fuel and admit plenty of air, yet if the used-up materials are not removed the fires soon cease to burn. So with our bodies; if the worn-out tissues and waste materials are not daily removed, their effect upon the system is poisonous, for they interfere with the functions of the organs, produce disease, and eventually destroy life. Water is the medium of conveyance by which the worn-out tissues are gotten rid of. No other material can supply its place or do its work.

Diseases arise from one of four causes: either by those poisons which are taken into the body from without; by the

retention of those poisons engendered within; by exhaustion of vital force;* or by an effort to repair damages that have been done to the organism.

The true method of arresting disease is to remove the cause. One of the most efficient agents for accomplishing this is water. At the varying degrees of temperature, and by the different methods of application, water can be so applied as to excite special action in almost any organ of the body. It may be so given as to cause vomiting, purging, sweating, diuresis, etc. It may be made a tonic, a stimulant, a sedative, an alterative, in short, by means of it we can accomplish nearly all the grand results aimed to be produced by medicines. Inflammation in some part of the body is an accompaniment of most of the diseases to which the human family is liable; this is more quickly and effectually allayed by water than by any other means; and as water enters so largely into the composition of the human body, we have the assurance that however much may be absorbed no evil results will follow.

The skin contains about seven millions of little canals or sewers called pores, and through these, three-fourths of the offete matter of the body is excreted; the mouths, or discharge pipes of these pores, open upon the surface, and deposit their contents upon the skin. If this waste matter is not removed it accumulates, dries, and soon chokes up these openings, thus preventing the proper discharge of their contents, or perhaps entirely closing them.

A daily bath is the most effectual means of removing these deposits, for persons in ordinary health; but when the pores have for a long time been closed and effete matter has accumulated in the system so as to cause disease, two or three baths a day may be necessary to remove it successfully.

The cooling property of water renders it of priceless value during the hot season, when a constant evaporation is taking

* See the Author's work on "VITAL FORCES; HOW WASTED AND HOW PRESERVED."

place through the skin and lungs, and also in the treatment of inflammation and fevers. The regulation of the temperature is of paramount importance in treating all diseases, whether acute or chronic. Recent experiments with the use of the thermometer clearly demonstrate this fact. The natural temperature of the body in health is 98° Fahrenheit. If from any cause the temperature rises above 107° it is almost inevitably fatal to life; or if it falls below 91·5° it is equally fatal. In all inflammations and fevers there is an increase of temperature, and the danger depends upon the degree of heat that is present; the treatment indicated is to subdue the heat and equalize the circulation of the blood. If the temperature of the body is kept within 2° or 3° of the natural standard there is no danger in any case. A thermometer placed in the armpits for a quarter of an hour will indicate the degree of heat present.

Water is the most efficient agent known for regulating the temperature of the body. Tepid, cool, or cold water will reduce it if too high, and warm or hot water will raise it if too low. Dr. Johnson says, "Water, when taken into the mouth and stomach, or poured over the surface, cools more than does an equal weight of any other liquid or solid that could be applied." This arises from the circumstance that it takes more heat to give a sensible warmth to water than to an equal weight of any other common substance. Hence, when water evaporates from the skin, it serves as a constant cooler of the surface, while the vapor which escapes with the breath cools equally the internal parts of the body. The greater the variation of temperature in any case the more constant and assiduous must be the applications both internal and external.

The cleansing, absorbing, dissolving, and cooling power of water, by means of which the *débris* of the system is removed and its temperature regulated, renders this element of exceeding value as a health-preserving and health-restoring agent.

EFFECTS OF HEAT AND COLD.

Heat and cold exert a powerful influence, not only upon the circulation of the blood and the temperature of the body, but also upon the nervous system. Heat is simply a peculiar motion of the atoms of matter, the varying degrees of temperature being but varying degrees of motion. Cold is a relative term and denotes slight motion of atoms, or, in other words, absence of heat. When heat is communicated to any substance, it causes that substance to expand, and when heat is withdrawn, or, in common parlance, cold applied, the opposite effect is produced, namely, contraction. Heat applied to the body expands the vessels of the part where the application is made, and increases the activity of the nerves. The blood vessels enlarge, lose in a measure their contractile power and become distended with more than their usual supply of blood. Cold applied to these vessels contracts them, forcing the blood out, leaving less than their usual supply.

In congestion and inflammation the circulation is obstructed, the capillaries being distended and surcharged with blood. The most successful means of overcoming this condition is by cold applications which absorb the heat, produce contraction, and force the blood out; or by alternate applications of heat and cold to keep the blood circulating freely through the parts until the cause of the difficulty is removed.

If, however, the inflammation be deep seated, hot applications in the region of the inflamed part, distending the capillaries and inducing a more copious flow of blood to the surface, will afford relief by diverting the blood from the diseased organ.

When any part of the body is wanting in its due portion of blood, which is frequently the case with the surface, especially the hands and feet, a sensation of coldness results, and by applying heat to these parts, the capillaries are distended, the blood flows more freely, and they thus become warm.

The first effect of cold applications is to force the blood in

upon the internal organs, thereby exciting the heart to increased action to force the blood back again into the capillaries; and if the cold is not too intense, or too long applied, the increased activity of the circulatory system makes the circulation freer and the parts warmer than before. This is termed reaction, and explains the fact that a person with a vigorous constitution, will be warmer after a cool or cold bath than after a tepid or warm one.

HEAT AND COLD TO THE SPINE.

Heat or cold, applied over the spinal column, exerts an important influence upon different parts of the body. The effect upon the internal organs and remote parts of the body is directly opposite to that produced upon the capillaries in the region where the application is made. To illustrate: by applying heat to the feet, the flow of blood to them is increased, and they become warm; the same result is accomplished by applying cold to the lower part of the spine. Cold is applied to the bleeding vessels to stop uterine hemorrhage; hot applications to the middle of the spine will have the same effect. Cool or cold compresses are applied to the chest for pleurisy or inflammation of the lungs; hot applications to the spine, between the shoulders, will arrest these inflammatory processes much more speedily.

A knowledge of these facts, and of the correct methods of applying heat and cold to the different portions of the spinal region, and to other portions of the body, serves to make these the most powerful agents we have for the control of disease, whether acute or chronic.

There are thirty-one pairs of spinal nerves, one of each pair being given off on either side of the spinal column. Each nerve has two roots, a posterior or sensitive, and an anterior or motor root. These two roots unite near the spinal cord, forming one nerve, which, after receiving two small fibers from a ganglion of the great sympathetic nerve, extends to

some remote part of the body. Thus the thirty-one pairs are distributed, each in its order to the different organs.

The great sympathetic nerve, so called because through it is produced a sympathy between different organs of the body, consists of a series of ganglia, connected by nerve fibers, situated on each side of the spinal column, and extending from the base of the skull to the lower part of the spine. When heat or cold is applied on each side of the spine, over these ganglia, it exerts a powerful influence upon the organs to which nerves from these ganglia are distributed.

Hot applications over the ganglia that send nerves to the lungs, heart, stomach, liver, bowels, kidneys, or genital organs, will diminish the flow of blood to those organs. Thus for inflammation of the head and throat, apply cold to the inflamed parts, and heat to the back of the neck; for inflammation of the pleura, lungs, or heart, apply cold to the chest, and heat to the spine between the shoulders; for inflammation of the stomach, liver, or spleen, place cool or cold applications over the part, and apply heat to the spine, just below the shoulder blades; for inflammation of the bowels, kidneys, or genital organs, apply cold to the inflamed part, and heat to the middle and lower part of the back. Heat, applied to the spine in these places, will check hemorrhage in the organs to which the particular nerves over which the application is made are distributed. Uterine hemorrhage is effectually arrested by the application of heat to the middle of the back.

Ice applied between the shoulders increases the flow of blood to the breast and warms the hands. Ice applied to the lower portion of the spine prevents cold feet, relieves painful menstruation, piles, constipation, cholera, chronic diarrhea, spermatorrhea, and removes diseases of the bladder and many other difficulties. Ice applied the whole length of the spine is very effectual in cases of epilepsy, Saint Vitus's dance, diabetes, and paralysis.

The world is indebted to Dr. John Chapman, of London, for important discoveries made in this direction.

BATHING PROCESSES.

The importance of water to the life, health, and happiness of the human family, as well as to all other organic beings, has been clearly indicated in the foregoing pages, and it now remains to consider the various bathing processes and methods of applying water as a health-preserving and health-restoring agent.

The application of water as a remedial agent is both a science and an art, the principles of which must be thoroughly understood in order to insure success in the practice. The prejudice which exists against its use, not only in the popular mind but with the medical profession, has been caused by the injudicious use of it. In some hands it has been invariably successful, while in others it has proved a failure, the different results being due to the difference in knowledge and skill of those by whom it was applied.

As a guide to bathers and those who have charge of invalids we submit the following

RULES FOR BATHING.

First.—Baths should not be taken within at least one hour before eating, nor within two hours after; and not within two hours before, and three hours after, is still better.

The reason for this is, that in bathing, the blood is brought to the surface in large quantities and circulates freely in the capillaries of the skin, being drawn away from internal organs and generally diffused through the whole body, and the more freely this external circulation and warmth is kept up, the more refreshing and invigorating the bath becomes, and the greater the benefit derived from it; whereas, when the stomach has recently been supplied with food, the blood

is diverted from the external circulation to the digestive organs to supply the secretions and juices necessary to carry on the digestive process.

From these facts, it will be evident that if food be taken into the stomach too soon after a bath the blood is directed to the stomach before a full reaction has taken place, thus interfering with its beneficial effects; while on the other hand, if the bath be taken too soon after a meal, the blood is diverted from the digestive organs before digestion is completed, and thus a very important function of the body is interfered with.

In cases of active congestion or inflammation, in fevers, or in severe pain and distress, it may be necessary to make water applications irrespective of this rule.

Second.—The head and face should be thoroughly bathed at the commencement of every bath. This will prevent the rushing of blood to the head and ward off unpleasant sensations.

Third.—A bath should never be taken when the body is exhausted, or too greatly fatigued by exercise, as a person in such a condition would not be likely to secure the proper reaction and warmth. Moderate exercise before a bath is usually beneficial, as it accelerates the circulation and secures a comfortable degree of warmth, which is always desirable before taking a bath. There is no danger from taking a general bath while in a perspiration, providing no fatigue accompanies it; for the sitz and foot baths, however, it is better that the body be warm, but not perspiring.

Fourth.—All general baths should be taken briskly, and the bather himself, if able, should rub vigorously that he may quicken his circulation and respiration, and thus secure the warmth and glowing reaction that is so essential after every bath; this should be observed not only while in the bath but in rubbing dry after it.

Fifth.—For drying the body after a general bath, a strong linen or cotton sheet is much better than towels; this should

be for an adult at least two yards square, so as to envelop the whole body like a cloak, and with it he should be rubbed or rub himself till thoroughly dry—by using the sheet for wiping, the body is protected from the air, the escape of heat is prevented, and there is much less liability to feel chilly afterward—towels will suffice, however, for all local applications.

Sixth.—At the completion of the bath, the bather should immediately dress and, if able, exercise in the open air, or engage in some active employment. If not able to exercise, it is well to cover up warm in bed for an hour or so, and sleep, if possible.

Seventh.—Very nervous persons or those whose digestion is much impaired, or circulation is imperfect and feeble, or temperature is below the normal standard, should be careful not to use cold water to any great extent in bathing; it may have a temporary beneficial effect, but in the end their sufferings will be likely to be increased.

Eighth.—Feeble invalids, consumptives, persons subject to hemorrhage of the lungs or stomach, those who have just passed the crisis in fevers or other acute diseases, those suffering from profuse discharges, such as suppurations, diarrhea, cholera, etc., and also females during the menstrual period should avoid the use of cold water, as well as the excessive use of it in any form.

Ninth.—Always use a thermometer to determine the temperature of baths for invalids.

Tenth.—An invalid should not bathe in a room with the temperature below 70°, and for most persons 80° or 85° would be better, provided there is good ventilation.

TEMPERATURE OF BATHS.

The beneficial effects to be derived from bathing depend very much upon the temperature of the bath, and the manner in which it is given; and those physicians who exercise the

most discretion in adapting these to the various temperaments and conditions of their patients, will be the most successful in their practice.

A bath of a given temperature, entirely appropriate and beneficial to a patient of one temperament afflicted with a certain disease, might be of little use or even absolutely injurious to a patient of a different temperament, though suffering from a similar disease.

Some of the early German practitioners have brought the Hydropathic practice into lasting disrepute by their indiscriminate use of the cold bath; and on this account we find many persons who have such a horror of the "Cold Water Cure," that they will hardly tolerate the use of water at any temperature even for purposes of cleanliness.

We shall classify baths according to their temperatures, into cold, cool, tepid, warm, and hot; beside these we have refrigerations, fomentations, vapor, and hot-air baths. In this classification we are not governed in the least by the sensations of the bather, but the temperature is regulated according to the degrees of heat as indicated by the thermometer.

The nervous sensibilities of people differ so widely that a bath which would seem tepid to one would feel cold to another, while it might appear warm to a third; again, the sensations of the same person vary so much in different conditions produced by disease, by exercise, by the temperature of the surrounding atmosphere, etc., that a tepid bath might feel warm at one time and cool at another.

We call a bath cold when the water is of the temperature commonly found in wells, springs, cisterns, rivers, and lakes; water baths can rarely be borne above 110°, yet some can bear 115° as readily as others can 100°.

The vapor bath can be borne as high as 120°, but is usually given from 105° to 115°.

The Turkish or hot-air bath is enjoyed by many at temperatures varying from 150° to 240°, and is less liable to pro-

duce unpleasant sensations at 180° than is the Russian or vapor bath at 110°.

When we speak of the administration of cold, cool, tepid, warm, or hot baths we shall refer to them as indicated by the temperatures denoted below; the minimum or maximum degree of each must be approached as the condition of the bather would indicate.

Cold baths, from	32° to 65°
Cool baths, from	65° to 80°
Tepid baths, from	80° to 92°
Warm baths, from	92° to 98°
Hot baths, from	98° to 115°

1.—SPONGE OR TOWEL BATH.

This bath may be taken by those able to administer their own baths by spreading a rug or bit of carpet upon the floor, and standing upon this with a bucket of cool or cold water into which they may dip a sponge or towel, squeezing it till it will not drip. Begin by washing the head, neck, face, and arms, rubbing vigorously until the skin is red. Wipe these parts with a dry towel. The chest, abdomen, and back are to be washed and wiped in the same manner, and lastly the lower extremities.

This is a universal bath, and may be given in bed to those who are too feeble to take any other; in these cases use a soft towel or sponge just moistened in tepid water, washing, drying, and covering each part in succession. In all forms of fever, or when there is difficulty in moving the patient or in giving more vigorous treatment, this is the mildest, safest, and best. It will cleanse the skin quite thoroughly, equalize the circulation, relieve local congestion, subdue fever, reduce the temperature, and give a general feeling of freshness and comfort.

2.—RUBBING WET SHEET.

There are two or three forms in which the rubbing wet sheet may be administered, and the one chosen should depend upon the condition of the bather, and the amount of water necessary to be used. If the bather is feeble, the water should be tepid or warm, and the sheet wrung nearly dry. If the bath is to be taken where it is desirable not to soil the carpet or floor, the sheet should be wrung so as not to drip. If the requisite amount of moisture and friction is not secured by one application, the process may be repeated the second, or even the third time. To make the bath more thorough, as may be necessary in fevers, or in case of persons with vigorous reactive powers, it is better to prepare a rubber or oilcloth, or let the bather stand in a tub or some suitable vessel, and use the sheet *dripping*, either with a partial wringing or without wringing at all. When a very vigorous bath is required, a second or third application of the dripping sheet may be necessary.

It is well to have the rubbing or dripping sheet large enough to completely envelop the body, and when it has been wet and prepared, the attendant should take it by the corners of one end and quickly throw it over the shoulders, lapping the edges in front so as to cover the whole body, and then rub very rapidly and vigorously, not with the sheet but with the hand over it, touching repeatedly every part of the body, not forgetting the feet and hands; he should rub quickly in this way for two or three minutes; then, unless the process needs repeating, the wet sheet should be removed and its place supplied by a dry one, and active rubbing kept up till the whole body is dry and warm. The bather should assist in the drying process, and may, if practicable, assist during the whole operation.

The rubbing wet sheet is applicable to those feeble, nervous patients who could not well bear a full bath; also to cases of general debility and nervous dyspepsia, when the hands

and feet are cold and the circulation feeble, and in cases of fever and local inflammation. This bath has the effect of a tonic, a stimulant, an alterative, and an anti-spasmodic. The good effects depend, in a great measure, however, upon the quickness and skill with which it is administered. It is one of the most convenient forms of bath to give after a wet-sheet pack, or a hot-air or a vapor bath.

3.—SHALLOW BATH.

For this bath a tub of wood or metal is required, about five feet long, two feet wide, and one and one-half feet deep; more convenient if the bottom be four or five inches shorter, and three or four inches narrower than the top. The water should be about four inches in depth; into this the bather should sit, the limbs being extended, and at once proceed to rub himself as vigorously, energetically, and rapidly as possible. The arms, chest, legs, and feet should each receive their share of the brisk rubbing, and if an attendant is present he should, at the same time, rub the back and shoulders; if there is no attendant, the bather should have a large sponge, and filling it with water squeeze it repeatedly over the neck and shoulders, letting it run down the back. In the absence of a sponge, a coarse towel, a yard or more in length, may be used, and after dipping it in the water a few times and pressing it out as in the use of the sponge, it may be thrown across the back and one end grasped above the shoulders with one hand, the other end by the other hand below the waist, and then drawn quickly in various directions across the back till it has received its full share of the general rubbing. This operation may continue from one to ten or fifteen minutes, according to the condition of the bather and the temperature of the water; or, if it is prescribed by a physician, as long as in his judgment the condition of the patient requires.

If the bather rubs himself as actively as possible, it will quicken his circulation, prevent a tendency to chill, and secure

a better reaction after the bath. On coming out of the water a large sheet should be thrown over the shoulders, and with this he should rub and be rubbed as vigorously as possible until dry and warm.

This bath is one of the most useful of all bathing appliances in Hydropathic establishments, and is frequently used after fomentations, wet-sheet packs, etc. It is a better tonic than quinine or iron, a safer stimulant than wine or brandy, and, when properly used, a more effective alterative than calomel or cathartics. It is very useful to cool the blood in the hot stage of fevers, and in many forms of inflammatory disease; in overcoming any local congestion of the internal organs; in resuscitating a person after a nervous shock, or in spasmodic diseases, such as fits, convulsions, apoplexy, etc., and in allaying and subduing the excitement of a debauch or an attack of delirium tremens. It produces different effects according to the temperature and length of time employed. It may be used cold, cool, tepid, warm, or hot, as the constitution of the patient, the difficulty to be removed, or the effect desired would indicate. It is often given warm at first, and made cool or cold before the patient is taken out. The cool or tepid is the best and safest temperature at which this bath should generally be used. It may be given in a common wash-tub, or in a hip bath-tub, though in these the limbs must of course be flexed.

4.—THE HALF BATH.

This bath is used in precisely the same way, and for the same purposes, and is given in the same manner as the shallow bath, differing from it only in having a greater depth of water. The water in the half bath is a foot or more in depth, instead of four inches. It can not be quite so vigorously and quickly given, as the greater quantity of water interferes somewhat with the active rubbing. Yet it is equally useful, and many prefer it to the shallow bath.

5.--THE FULL BATH.

For this bath a tub is required nearly or quite as long as the body, and two feet or more in depth—a slope at the head of the tub is very convenient, though not absolutely requisite. The tub is filled with water to such a depth that the bather will be submerged, all except the head. The method of giving it is similar to that of the shallow bath; the bather, however, lying instead of sitting. It may be given in nearly all cases where the shallow bath would be applicable, by having the water a little warmer, the temperature being adapted to the condition of the bather. It is *the* bath for cleanliness and refreshment, and is well adapted for an evening bath. After the toils and fatigue of a day of labor, either mental or physical, the full tepid or cool bath will cleanse the skin, remove the soreness from the muscles and stiffness from the joints, and calm the excitement of the brain and nervous system, thus giving preparation for a quiet, refreshing sleep.

The warm or hot full bath taken on going to bed is one of the most successful means of breaking up a cold.

The hot full bath is also very useful in relieving the acute pains of neuralgia, rheumatism, gout, and many other painful inflammatory affections. It will sometimes cut short the cold stage in chills and fevers. The hot and cold full bath are very powerful applications and must be administered with discretion; yet there is little danger to be apprehended from their use compared with the indiscriminate use of medicines so common among the mass of people at the present day.

6.—THE SHOWER BATH.

In the early days of Water-cure, the shower bath became one of the most popular of the Hydropathic appliances, and was thought by many to be the full representative of the Water-cure practice. It was often used without advice, with-

out discretion, and without regard to the constitution or condition of the bather; it was generally applied cold, and, as a natural consequence of this indiscriminate use, was the agent whereby much injury was done.

Persons of nervous temperament, with impaired digestion and feeble circulation, would go, martyr like, from their beds to the cold shower bath, and return shivering to dress and go out for a walk, which could never be sufficiently brisk to bring back the natural warmth; and, after a few such applications, they would find themselves more nervous and excitable, with greater derangement of the digestive function, less general warmth of system, and in a worse condition in all respects than before. The result of such treatment would naturally lead the friends of the bather, if not the bather himself, to the conclusion that Water-cure was a humbug, and the more it was "let alone" the better for the race.

Yet, the shower bath, notwithstanding the abuse in its application and the consequent injury, is, when properly applied, one of the best baths ever employed. If man's dwelling were the open air, with but the starry canopy for his roof, he would have but little need to bathe, for the gentle showers and the heavier rains would answer well the purpose. The shower bath is but artificial rain, and may be so applied as to be both luxurious and invigorating.

Few persons are able to take this bath at a temperature lower than sixty degrees, but as a general thing, from seventy to eighty-five degrees should be the rule. This is not so much a bath for the country as for the city, where every house is supplied with bath rooms, with hot and cold water in abundance; here a shower bath may be so arranged that the water can be used at any desired temperature and changed from warm to cold at pleasure. A pan or basin perforated with holes is attached to a pipe, which is formed by the union of two pipes, one transmitting hot and the other cold water, with faucets by which the degree of heat or cold may be regulated. The pan need be placed but a little higher

than the head, for the pressure from the reservoir gives the water sufficient force. To begin with the water tepid, then change to cool, followed by a dash of cold, is the best plan for most bathers. Let it fall first upon the hands and arms, rubbing them vigorously; then upon the feet and legs, then the neck, back, and chest, rubbing each part while the water falls upon it; then turn the body, alternately exposing different parts to the falling shower for two or three minutes; for some temperaments, however, a better reaction may be secured by first letting the water fall directly upon the body.

As a general rule the cold water should not fall on the top of the head, nor even the tepid water, if the hair is long and heavy; but if it is short, and the bather in good health, it is a great luxury to let the tepid or cool water come trickling down over the head, face, and entire body.

This bath may be so applied as to be beneficial to almost every one except those who are very feeble. A person who is full of blood, with good digestion and active circulation, can enjoy a shower bath as cold as it comes from the spring or hydrant; but it is never to be recommended thus to invalids or those with nervous temperaments, as their difficulties would only be aggravated thereby. The most convenient apparatus for home use in the country is a double-bottomed bucket, the lower bottom being full of holes and the upper one tight, with a valve in it to which a string is attached; the bucket being filled with water of the proper temperature, when the bather is ready he pulls the string, raising the valve and letting the contents of the bucket fall upon him, rubbing vigorously the while as previously described. Only a limited quantity of water can be used with this apparatus, and consequently it can not be so thorough or so pleasant.

The shower bath may be made a powerful tonic, and is useful for cleanliness, for increasing the external circulation, and for removing internal congestion and inflammation; it may be given with advantage, in some cases, after a pack,

fomentation, vapor bath, or Turkish Bath; and for those in a vigorous state of health it is a decided luxury to take it cold, as a regular morning bath.

7.—SPRAY BATH.

This bath can be used only by attaching a hose pipe, with the spray appendage, to a force-pump or water-pipe where there is a considerable amount of pressure. The spray apparatus is a piece of brass or copper, shaped like a tea-saucer, about two or three inches in diameter, with a flat plate on the top pierced with innumerable small holes, there being a hole in the bottom around which a rim is extended sufficient to attach a hose-pipe. The pipe should be so arranged that the spray may be given at an agreeable temperature, or changed from warm to cold at pleasure. This is, to some, the most agreeable bath in the whole range of Water-cure appliances. It may be used after the vapor, or the Turkish Bath, after the wet-sheet pack, and fomentations, or as a simple bath by itself. It is exceedingly useful in subduing local inflammation, reducing tumors, and treating ulcers and abscesses. I have had several cases of local swelling, accompanied with the most intense pain, which were relieved in a few hours by alternate applications of the hot and cold spray. By this means the pain is subdued and the inflammation reduced sooner than by any other method.

8.—DOUCHE BATH.

There are several varieties of douche, as the falling, hose, pail, cataract, local, etc. The falling douche is a stream of water falling from a height of two, three, or more feet upon the bather. The water is generally used cold, but it may be moderated in temperature where there are conveniences for so doing.

The water should generally fall first upon the hands and

arms, then upon the feet and legs, then upon the chest, abdomen, shoulders, back, etc., the bather turning quickly and rubbing himself as vigorously as possible. The water should never be allowed to fall upon the head, nor should this bath be used except by those who possess strong reactive powers.

9.—HOSE DOUCHE.

This can be used only when there is sufficient pressure of water to eject from a hose-pipe a stream from half an inch to an inch or more in diameter. This, coming in a horizontal direction, requires an assistant to move the hose and direct the stream successively upon different parts of the body. The turning and rubbing should accompany this bath as in those previously described.

10.—PAIL DOUCHE.

The bather being prepared, an attendant dashes three or four buckets of water over the chest, back, and sides. The water may be of any desired temperature, but it is well to have the first tepid, and each succeeding bucketful a little cooler, and if the bather possesses sufficient vigor of constitution, the last one may be cold. This is an excellent morning bath, and is often used in Hydropathic establishments.

11.—CATARACT DOUCHE.

This is a sheet of water, a foot or more in width, made to fall obliquely upon the body. It is sometimes given by means of two tubs so arranged, one on each side of the bather, that their contents may be emptied simultaneously in a broad sheet, striking the shoulders and chest. The bather must work vigorously during this process.

12.—LOCAL DOUCHE.

In this, a stream of water is applied to some particular portion of the body, and for a special purpose. A falling stream from any source, even a pitcher held high above the part, will answer the purpose. This is an excellent application for removing tumors, reducing chronic enlargement or inflammation of the joints, for healing old ulcers, fever sores, etc. The water may be of any desired temperature or alternated from hot to icy cold.

By this process the blood is constantly changed and not allowed to stagnate, the absorbents are vigorously set to work, the diseased tissues carried away, and their place supplied by sound material.

13.—PLUNGE BATH.

This bath requires a body of water large enough to enable the bather to be entirely immersed. The natural baths afforded by rivers, ponds, lakes, and the sea are resorted to by the masses; but in Water-cure establishments, it is usually taken in a deep tub or tank which allows the bather to take hold of the side and plunge in and out at pleasure. In our institution we have a tank for this purpose, thirteen feet square and four and one-half feet deep, so arranged that, while fresh water is being constantly admitted, it can be made of an agreeable temperature.

There are few greater luxuries than a dive into the plunge after a thorough shampooing in the lavatorium of the Turkish Bath.

14.—THE HIP OR SITZ BATH.

Although this is usually regarded as a local bath, yet in the absence of conveniences for giving a full bath, it may be used for producing all the beneficial effects of a general bath.

It may be given in a common wash-tub, although it is best given in a tub made for the purpose, with the bottom raised three inches from the floor, and the back extending six or eight inches above the front, sloping backward at the sides so as to afford a support to the bather's arms and back. It should be deep enough to allow the water to cover the hips and a good portion of the abdomen. Usually it requires about three or four gallons of water, and the temperature at which it should be given depends entirely upon the condition of the bather and the effects desired to be produced.

It may be given cold, cool, tepid, warm, or hot. The cold and hot being the extremes, are of course much the most powerful, and require greater care in their application. The hip bath, when applied cool or cold for a short time and frequently repeated, is considered a powerful tonic, but when extended to twenty or thirty minutes, whether at a similar temperature or warmer, it becomes a strong derivative and sedative.

It is always best to throw a blanket around the bather while taking this bath, and to rub the hips and abdomen thoroughly while in it.

For diseases of the bowels and pelvic viscera it is invaluable. For constipation, diarrhea, dysentery, and piles; for diseases of the kidneys, bladder, and genital organs, and for chronic affections of the stomach, liver, and spleen, it is one of the most effectual applications that can be used in home treatment. It is very useful, also, in diseases of the brain, and in almost all forms of fever and local inflammation. It is indispensable for successfully treating a large class of female weaknesses.

I have had several cases of fever, in which very marked relief of the head, and also of the excessive irritation of the stomach and bowels, has been obtained by the hip bath.

For relieving the severe paroxysms of pain in the passing of gall-stones, for gravel, for severe congestion of the liver or

kidneys, and for pain in the bladder, the hip bath, either hot or cold, will be found of great service.

When a general bath is to be given, the bather should sit in the tub with the water at an agreeable temperature, and an attendant rub the back, chest, and upper extremities with a towel or sponge; wipe them dry and cover them, and then treat the lower extremities in the same manner. Cold hip baths should not be of long duration, except when advised by a physician, as they may give rise to congestion of the pelvic organs.

15.—WET-SHEET PACK.

There is need of one sheet, one thick woolen blanket, and one or two comfortables—or several blankets in place of the comfortables—to administer the pack successfully. The comfortables are spread upon a bed or lounge, the blanket spread over them, and the sheet, having been wrung from tepid, cool, or cold water, is placed upon the blanket; the patient having removed his clothing lies extended upon the sheet in such a way that the upper edge of it shall come fully up to the ears. The patient then lifts his arms, and one side of the sheet is drawn over the body, letting it come under the arms, tucking it snugly under the opposite side; the arms are then dropped down by the sides, and the other half of the sheet, being drawn over so as to infold the arms, is brought down as tight as the comfort of the patient will admit, and tucked well under the other side—it should be wrapped closely around the neck and feet; one side of the blanket should then be brought over and tucked under in the same way; then the opposite side; and after this the remaining blankets or comfortables should have the two sides alternately brought over and tucked under in a similar manner.

The part of the process from the time the bather lies upon the sheet till he is well wrapped in the first blanket, should

be performed as quickly as possible, so as to prevent chilliness.

In order to have the packing done properly about the neck, it is well to take hold of the upper corner of the blanket or comfortable with one hand, and draw it down over the shoulder, lengthwise of the body; place the other hand upon the shoulder over which it is drawn, to hold it in place while the corner is folded back under the chin and tucked under the opposite shoulder; do the same with the opposite side, and if this is done with each blanket and comfortable, the neck will be so well covered that the air can not well get in at this point. The blankets should be long enough to be folded back around the bottoms of the feet and tucked under, so as completely to exclude the cold air.

The head should be elevated so as to be comfortable, and a wet cloth placed upon the forehead; a hot jug or brick should be placed at the feet if they are inclined to be cold. It may be necessary in some cases to place hot bottles at the sides, or other parts of the body, in order to have the patient become sufficiently warm.

The temperature of the water from which the sheet is wrung should depend upon the condition of the bather. If there is a good degree of vital force, a better reaction will be secured in a cold pack than in a tepid or warm one; but many persons have so little animal heat that they will not easily react if the sheet is applied cold.

The length of time a person should remain in a pack also depends very much on circumstances, and should vary from ten minutes to two hours or more. It is thought by some, that perspiration should always be established; this is not essential, yet it is a favorable indication if bathers perspire readily. It is quite essential, however, that the bather should get thoroughly warm, and if he is inclined to be chilly a cup of hot water should be given to drink—which may be repeated at short intervals—hot bottles or bricks placed around him, and perhaps more clothing may be necessary.

If the patient lies comfortable and quiet in the pack, it will do no harm to remain from one to two hours, but if the head aches, or he becomes nervous and irritable, he should be taken out and put in a tepid or warm bath. The full bath, half bath, rubbing-sheet, or sponge bath should be used immediately after the pack.

In cases of high fever or severe inflammation, the pack may be repeated three or four times in twenty-four hours; the sufferer remaining in only till thoroughly warm, then being taken out, bathed, and soon put back again.

The pack is one of the most powerful, most useful, but most abused of all the water appliances. Among those who know but little of the principles and practice of water treatment the wet-sheet pack is almost universally dreaded, and yet, as soon as people get a smattering of ideas with regard to Water-cure, this bath is generally more or less abused. It is resorted to for the cure of diseases to which it is not at all applicable, and is often administered to those whose temperament or conditions are totally unfitted to receive it.

But, let us inquire, what are the diseases and conditions to which the pack is applicable? Dr. Edward Johnson says, "The wet-sheet pack has certainly the power of depurating the blood. Of this we have the unquestionable evidence of occular demonstration. It is a powerful anodyne and antispasmodic, as well as depurative. It allays excitement, soothes the nerves, and lowers the pulse." Dr. John Bell says, "It is a stimulant, a depurative, a resolutive, a digestive, an opiate," etc. The facility with which irritation is allayed by means of the pack is one of the most important facts in relation to Water-cure. "When properly modified to meet the actual state of the patient, it may be said to be the most soothing application that can be administered to the external sentient surface." One important result of the wet-sheet pack is to produce augmented and healthy secretions from mucous membranes, particularly the digestive.

Many curious phenomena occur in some patients by the

frequent use of the pack. Sometimes the entire surface will assume a beautiful rosy hue; this will continue for a week or two, then cease, and again return after a few weeks. In my own practice, I have frequently known the pulse of a patient suffering from fever to be reduced twenty or thirty beats to the minute, and the headache and heat of skin almost entirely removed, by lying for an hour in the wet sheet. In some cases, the sheet when removed from the patient is found to be glutinous. I have also *seen* distinctly the fetid matter upon sheets in which the patient had been packed, and the odor arising from them was such as to make it exceedingly unpleasant to remain in the room. By means of the pack mercury and other poisons, taken into the system years before and retained in the tissues of the body, have been worked out of their hiding places and thrown into the circulation sufficient to cause severe salivation. Sulphur has also been eliminated from the system so as to blacken silver in the pockets, and fill the room with its odor.

A frequent repetition of the pack not only removes morbific agents from the system, but has a tendency to establish a strong determination of blood to the surface, thus relieving the congestion of internal organs; in short, the wet-sheet pack tends to purify the blood, and cleanse the skin and internal organs; it removes heat of surface, restores the body to its natural temperature, reduces inflammation, soothes and quiets the nerves, promotes sleep, equalizes the circulation, takes away the causes of disease, and improves the health generally.

16.—DRY PACK.

The dry pack differs from the wet, in that the patient is wrapped in dry flannel blankets instead of the wet sheet.

Perspiration is easily induced in the dry pack by drinking hot water and surrounding the body with hot bottles or bricks. This application abstracts less heat from the body

than does the wet-sheet pack. It should be followed by the towel bath, the rubbing sheet, or the half bath.

17.—HALF PACK.

This is given in precisely the same manner as the full pack, except that the wet sheet extends only from the armpits to about half way from the hips to the knees, leaving the arms and legs to be wrapped in the blankets only.

This form of pack is preferable for persons having poor circulation, with cold feet and hands, and a very small amount of animal heat. It is a milder application, abstracts less heat and is pleasanter for very nervous patients as it allows greater freedom of motion. It is also highly beneficial on account of its local effects in cases of inflammation of any organ of the chest or abdomen. Pleurisy, pneumonia, and inflammation of the liver, stomach, and bowels may often be entirely controlled by means of this application. It may be applied either cold, cool, tepid, or hot, to suit the condition of the patient, and should always be followed either by the towel bath, the rubbing sheet, or the half bath.

18.—CHEST OR STOMACH PACK.

This is given in a manner similar to the half pack, except that the wet sheet is applied to the chest and stomach only. It is useful in cases of inflammation of the stomach, lungs, or pleura, and in diseases of the heart, liver, and spleen. It is a milder application than the half pack.

19.—FOMENTATIONS.

The method of applying a general fomentation is to fold a flannel blanket so that it shall be three or four thicknesses, extending from the armpits to the hips, or a little lower; place this across the bed, and let the patient lie upon it in

such a way that the ends of the folded blanket can be brought over the chest and abdomen. Take a woolen cloth—folded about four thicknesses—large enough to cover the part to be fomented; roll up this folded cloth, and holding one end of the roll in each hand, dip the middle into boiling water; when it is completely saturated raise it up and twist it by the dry ends, wringing the water from it so that it will not drip. It may now be unrolled and held close over the part to be fomented till it is sufficiently cool to admit of its being pressed upon it; when this is permitted, bring one end of the folded blanket over, so as to cover it all in, and then the other end in a similar manner.

The hot cloth may remain covered by the blanket from six to twelve minutes, and then the application be renewed, or replaced by a fresh cloth, which is better. Care should be taken to expose the bather as little as possible while the hot cloths are being changed. Fomenting cans filled with hot water may be used to save changing the cloths. This process may be continued from twenty minutes to an hour or two, as the case requires.

The fomentations should always be followed by bathing the parts in tepid or cool water, with a sponge or towel, or by a hip bath, half bath, or rubbing sheet. The bather should avoid much exercise or exertion immediately after the bath, and, as in the case of other baths, should not eat for about an hour, or till a thorough reaction has taken place. If these applications produce headache or great prostration they should be discontinued.

There are some conditions and constitutions of a nervous character, to which *warm* fomentations are better adapted than *hot*, and the practitioner must of course discriminate in such cases as to which is most applicable. I have applied fomentations when the effect seemed almost magical; patients suffering from gall-stone, from gravel, or from stone in the bladder, are often relieved immediately, from the most excruciating pain, by means of hot fomentations.

This application will relieve severe pain and promote sleep in many of those aggravating cases where opium has failed.

In chronic congestion and irritation of the liver, stomach, bowels, and spleen, hot fomentations once a day, or every other day, will be of great service. Hot fomentations are also very beneficial when applied to the back in pneumonia and pleurisy, and across the lower part of the spine in retention of urine or to arrest uterine hemorrhage. Many feeble and nervous invalids who are not accustomed to bathing, can be easily and pleasantly prepared for the other Water-cure processes by taking the warm or hot fomentations for a time previous to other treatment.

It is one of the most effectual of all home applications—easily applied, and always attainable, and were its effects well understood we feel sure that it would soon take the place now occupied by many substances used as remedies.

The following report of a severe case of pneumonia will show to the reader how effectual are fomentations in relieving inflammation of the lungs and other internal organs. Miss B———, aged twenty-six, residing in New York City, on the night of November 26, 1868, contracted a severe cold which, three days after, resulted in inflammation of the lungs. A physician was called; had been four days in attendance and had given the best remedies his system afforded, but the patient had rapidly grown worse. A council was desired by both physician and family. I was sent for; found the patient with inflammation of both lungs, pulse one hundred thirty, respirations sixty per minute; severe pains through the chest, high fever, delirium, diarrhea (the result of calomel and jalap given by the mother); every symptom indicating severity and danger.

I immediately applied a hot fomentation between the shoulders in the manner above described. In less than one hour the severity of the disease was mitigated and the patient made comfortable. The next morning the mother said to me, "That fomentation acted like a charm, she has had the most

comfortable night of any since she has been sick." At this time I found the pulse one hundred forty, respiration forty-five. The fomentation between the shoulders was renewed twice during the day, in the form of a hot flaxseed poultice, and kept on two hours each time. These, with sponge baths, cool compresses to the chest, and regulation of diet, constituted the principal treatment. In three days the patient was thoroughly convalescent and in a week was able to walk about the house. I have also cured many afflicted with neuralgia and sciatica by hot fomentations. Flaxseed or Indian-meal poultices answer the purpose well in many cases.

The best apparatus for applying heat to the spine is an india rubber bag from four to eighteen inches long, made in two parts, each from two to three inches wide with a space between them. This double bag being filled with hot water, the space between the two parts is placed directly over the spine and firmly pressed down, the heat coming just each side of the spinal column. For further explanation of methods of applying fomentations to the spine, the reader is referred to the article on "Heat and Cold to the Spine."

20.—REFRIGERATIONS.

The effects of cold upon the human system have been previously described; the application of it is called Refrigeration. The usual means employed are cold water, ice water, cloths dipped in ice water, ice, ice and salt, or some other freezing mixture. When applied over the vital organs or to the capillaries of any part, cloths wet in cold water or ice water are generally best. When there is active inflammation with great heat, pounded ice directly applied, or put in a bladder or rubber bag and thus applied, is very useful.

For applying refrigerations to the spine, rubber bags from two to three inches in width and from six to eighteen inches in length, are necessary; the gullet of an ox, dried and tied at the ends, will answer the purpose. If the applications are

to be made over the roots of the spinal nerves or over the great sympathetic nerve, the bag may be made in two parts, similar to those for fomentations, and thus the cold is applied each side of the spinal cord, not directly over it.

In giving refrigerations, great care should be taken to prevent the wetting of the garments or bed clothes, and it is absolutely necessary that other parts of the body, particularly the extremities, should be kept comfortably warm.

Refrigerations are highly useful for the arrest of hemorrhages, for removing superfluous heat, for controlling the circulation of blood, and for overcoming congestion and inflammation. When applied to the spine they exert a powerful influence upon the motor nerves of various organs. They are beneficial in treating paralysis, epilepsy, chorea, convulsions, cholera, dysentery, diarrhea, gastritis, inflammation of the brain, etc. For further directions for its application to the spine, see article on "Heat and Cold to the Spine."

21.—TURKISH BATH.

The Turkish bath is supposed to have originated among the Romans, by whom it was considered such a luxury and held in such high estimation, that the floors and ceilings of the baths for ladies were often inlaid with silver and gold. It has been perpetuated and handed down to the present generation by the Turks, from whom it derives its name. It was introduced into England, Germany, France, and other European States only within the last quarter of a century, and into America within the last ten years. The first Turkish bath constructed in New York was at our institution, 13 and 15 Laight Street. It was opened to the public in 1865, and has been in successful operation ever since.

The arrangements for this bath usually comprise four departments or rooms, and several dressing apartments. In one of the latter the bather leaves his apparel and assumes the "cummerbund," tying it about his person as a shield. He

then enters the "Tepidarium" or tepid room, the temperature being at about 120°. Bathing thoroughly his head and face in water at an agreeable temperature, he takes his place on a couch or reclining chair, over which a fresh sheet has been thrown, and, with a wet towel on his head, sits until a slight perspiration is induced over the entire body. During this time he drinks as freely of water as his thirst demands, and the wet towel is frequently renewed.

When perspiration has fairly commenced he passes into the "Sudatorium" or hot room, in which is maintained a temperature of 145° to 180°. Here he remains until perspiration is freely induced from every pore, when he enters the "Lavatorium" or shampooing room. He now reclines on a marble couch, his head resting on a wet sponge or air pillow, and the process of shampooing begins. The body is thoroughly rubbed, manipulated, and percussed till all uncleanliness is removed from the skin and the blood circulates freely in every part, till the joints are limbered, and the muscles rendered more pliable, when a soft lather is applied to cleanse away any remaining impurities; this process is followed by the spray bath, warm at first but gradually reduced in temperature, and this succeeded, at the option of the bather, by the douche, shower, or a swim in the plunge. He is then rubbed dry with towels, wrapped in a clean sheet, and directed to the "Frigidarium" or cooling room, which is kept at a temperature of about 70°.

Here he reclines upon a sofa or chair, being well wrapped in a large woolen blanket, until the body is gradually cooled to its normal temperature, and the pores of the skin properly closed, his head meantime being dried with towels, when he resumes his dress and again enters the outer world. The whole process requires about an hour, but many people consider it such a luxury that they prolong it to two or even three hours.

After four years' experience with the Turkish bath, I am satisfied that it is the most thorough and most efficient hy-

gienic agent known for preserving health or treating the sick. It possesses the combined advantages of the wet-sheet pack, the half pack, the rubbing wet sheet, and the shower bath, and is much more agreeable to most people than any of these. By drinking freely of water the impurities in the system are absorbed, and the copious perspiration induced by the Turkish bath washes them out through the pores of the skin.

The effect of this bath is to refresh and invigorate the system, and overcome the lassitude and weariness incident to long protracted and fatiguing exercise. It removes the accumulated effete matter from the skin leaving it soft and supple; it removes congestion and chronic inflammation of the mucous membrane; it exerts a favorable influence and produces an agreeable effect upon the nutritive, sensitive, and locomotive apparatus; it imparts both mental and physical activity and strength; it corrects any irregularities of growth or undue development dependent upon the too great activity of some organs or weakness of others; it corrects any irregularity of function of the organs—as of menstruation and the difficulties accompanying it, whether they occur at puberty, later in life, or at the critical age in females; it is a protection against the dangers attendant upon inflammation, pleurisy, pneumonia, bronchitis, consumption, and rheumatism in those who have been chilled by recent exposure to cold, undue dampness, or fatigue; it helps to ward off hysterical and epileptic convulsions and every variety of nervous disorder; it promotes the absorption of lymph, and hastens the assimilation of matter in the tissues; it discusses tumors, and removes indurated concretions and stiffness, especially about the joints; it removes the causes of fever and inflammation, cures asthma and dropsy, and is often effectual in cases of lockjaw.

22.—HOT-AIR BATH.

This bath is especially adapted to home use, the apparatus for its application being readily improvised. The bather, in undress, should be seated in a cane or open-bottomed chair, and securely enveloped with blankets to prevent the escape of heat. An alcohol lamp may be placed just outside the chair, and a tin pipe used for conveying the heat to the bather within the blankets.

This bath may also be given while the bather is in bed. A frame, lifting the coverings two or three inches from the body, should inclose the bather; the heat may be generated by an alcohol lamp, and conducted beneath the bedclothes by means of a pipe as previously described. Great care should be taken to have the blankets well tucked in around the neck and feet.

By drinking freely of warm water while in this bath, a copious perspiration may be readily induced. The sponge bath, rubbing wet sheet, or half bath should immediately follow; if possible, before perspiration is checked or the body exposed to cold air. Very feeble persons may omit the water baths but should be thoroughly dried with towels. The capillaries must be well closed before the bather goes out. This bath is useful in cases of colds, rheumatism, gout, sciatica, dropsy, asthma, at the beginning of fevers, and for all diseases in which the Turkish bath is applicable.

23.—RUSSIAN BATH.

In the Russian bath, the bather is enveloped in an atmosphere of steam. Aside from this the processes are similar to those of the Turkish bath, though less elaborate, and the bather is exposed to more sudden transitions from heat to cold. The arrangements for this bath consist of one room, with three or four tiers of shelves, the varying degrees of heat being obtained by occupying the different tiers, the tempera-

ture increasing from the lower tier upward. The object sought is to produce perspiration; this being accomplished, the bather is vigorously manipulated with soap and brushes and flagellated with birch twigs. This bath is very valuable for some temperaments and some diseases.

The Russian bath is oppressive, however, at a temperature above 115°, while the Turkish is productive of less unpleasant sensations even at 180°; the reason of this is that extremes of heat and cold can be better endured in a dry than in a moist atmosphere. This is illustrated by the fact that in New York City where the air is moist, when the temperature in summer ranges from 95° to 100° we have a weekly record of from ten to one hundred deaths by sunstroke; while in California, with a dry atmosphere, and a temperature often above 100°, death from this cause is seldom known.

Again, when the temperature falls below zero in New York it is almost unendurable, while in Minnesota, with a dry atmosphere, 30° or 40° below produces little suffering. Even consumptives are able to pass the winter in Minnesota without inconvenience.

24.—VAPOR BATH.

The simplest mode of giving this bath is to seat the bather, disrobed, in a cane or open-bottomed chair, having thrown over it a sheet or thin covering as a protection from too great heat. Under the chair place a pail of boiling water, and about the bather and chair wrap two or three blankets, drawn close about the neck, and trailing upon the floor sufficiently to prevent the admission of air. Then place carefully into the water a hot brick or stone, lifting the blanket from the floor for this purpose and immediately dropping it again. Before the vapor caused by one brick subsides, another should be introduced, and this process repeated until perspiration is freely induced. Should it at any time be too hot the blanket may be slightly raised from the floor, but not

enough to produce chilliness. A foot bath may at the same time be used as hot as can well be borne.

The temperature of the room should not be less than 80°, and immediately upon removing the blankets either the pail douche, rubbing sheet, half bath, full bath, sitz, or towel bath should be administered. The water should be cool enough to close the pores thoroughly. It is an excellent plan to retire immediately after this bath.

Some bathers use a rubber blanket as a covering; some employ a wooden box, inclosing the body with the exception of the head; others use a small room, having the whole person enveloped in the vapor, breathing it freely. With such arrangements, vapor may be obtained from boiling water by means of a spirit lamp, or by introducing steam from a boiler. These rooms may be arranged with a shower bath, thus avoiding the exposure of the bather to the cold air before the water is applied, which should be carefully avoided in administering vapor baths.

This bath is applicable to most diseases for which the Turkish or Russian baths are given, though it is generally less effective. For breaking up a cold, for rheumatism, neuralgia, asthma, intermittent and remittent fevers this is a valuable home application.

25.—ELECTRIC BATH.

The electric bath consists essentially in the application of electricity during the process of bathing. It is universally acknowledged that moisture facilitates the transmission of the current, as it passes through the moist skin with great readiness but is imperfectly conducted when the skin is dry.

The most common mode of applying electricity, is by connecting one pole of the machine or battery to a metallic plate upon which the feet or some other parts of the body are placed, while the other is used to make local applications through a moist sponge or the hand of the operator. One

pole is sometimes placed in a foot bath with the feet, while the other is used to make applications to any desired part. The subject is sometimes placed upon an insulated stool and the currents passed through the body in various directions, the application being made either local or general, by passing it through any particular organ, along the course of any particular nerve, or over the entire body. The above methods of applying electricity are best for home use.

The method we have found most efficacious, especially in treating chronic cases, is to attach a large battery, so arranged as to permit the use of the galvanic or the electro-magnetic currents, to a bath of a size sufficient to immerse the entire body in warm water, with arrangements which permit the direction of the currents to be changed at pleasure. The use of the bath as a conducting medium, admits of the application of a much stronger current than would be possible without it and the whole system can be more fully and effectually charged while the pores of the skin are opened by the warm water.

Electricity is acknowledged by the leading minds of the several schools of medicine to be a useful agent in treating the sick. It is especially useful in treating acute and chronic rheumatism, gout, sciatica, neuralgia, paralysis, dyspepsia, constipation, piles, intermittent and remittent fevers, and derangements of the liver; for discussing tumors, and removing from the system mercury, lead, iodide of potassium, and other medicinal or mineral poisons.

26.—HEAD BATH.

The simplest mode of taking a head bath is to have the head thoroughly manipulated with a wet towel or sponge, and dried with a towel or by rubbing with the hands. Another method is to pour water upon the head, an attendant meanwhile rubbing it and drying afterward as before stated. Still another mode is to lay the head in a basin of water two or three inches in depth, putting the back and sides of the

head alternately into the water. When the water is used cool or cold, and the bath continued for fifteen or twenty minutes, it is useful for relieving excessive heat about the head, the bather sometimes falling asleep during the process. If there is much mental excitement tepid water is better than cold.

The pouring head bath, tepid or cool, is most excellent in treating delirium tremens, epilepsy, convulsions, sunstroke, bleeding at the nose, and inflammation of the brain; it also soothes delirium attending all forms of fever. Frequent sponging of the head in cool, cold, or ice water, will remove the heat or inflammation, allay the pain, and often save life in cases of hydrocephalus, or water on the brain. Hot head baths are sometimes more effectual than cold in relieving nervous headache, neuralgia, or deep-seated inflammations.

27.—FOOT BATH.

This bath may be given in any pail or basin large enough to admit the feet. The water may be two or three inches in depth or so as to cover the ankles. The good effects of this bath are materially increased by constantly rubbing the feet while in it. Foot baths may be of any desirable temperature. When taken cold, the water should be not more than one or two inches deep, and it should always be preceded and followed by active exercise. Shallow walking foot baths in cool or cold water, of ten or fifteen minutes' duration, will often prevent habitual cold feet. These are best taken in a shallow brook.

Hot foot baths are often beneficial in connection with the sitz and Turkish baths, before the wet-sheet pack or half bath, or while taking the dripping sheet. They afford relief in cases of headache, toothache, neuralgia, colds, catarrh, croup, and many ailments depending upon deranged nervous action or obstructed circulation. Hot or warm foot baths accomplish with less trouble and more pleasure, the object

sought in the application to the feet of draughts, mustard plasters, poultices, etc.

To break up a sudden cold, soak the feet and limbs half way to the knees for fifteen or twenty minutes in water at the temperature of 105° to 110°, drink freely of cold water, cover up warm in bed, and *fast* for a day or two.

The duration of the foot bath depends upon the condition of the bather, and should vary from one minute to an hour.

28.—EYE BATH.

The simplest form of eye bath is to dip up water with the hands, pressing it gently against the eyes. Another method is to dip the eyes into the water, opening and closing them while immersed. An eye syringe, or a fine spray tube attached to the elastic bulb syringe or to a hose-pipe, is a useful apparatus for giving this bath. An instrument called the eye cup has also been invented for this purpose. It is of glass, made to fit the eye, and holds a gill or more; this being filled with water is turned up against the eye. In the use of the cup the water should be frequently renewed.

These baths may be of whatever temperature the case demands, and frequent alternations from cold to hot are often beneficial. Milk and water sometimes has a better effect than water alone. Hot or warm fomentations, followed by cool or cold compresses, will often effect a speedy cure of inflamed eyes. These baths are much more efficient and far less dangerous than the many eye-washes, astringents, lotions, leeches, poultices, etc., so frequently used.

29.—NOSE BATH.

There are several methods of giving this bath. The Hand bath is the simplest, and consists in sniffing up water from the hand, taking from six to twelve or more sniffs at each bath and repeating as often as necessary. The Plunge bath

consists in immersing the nose in a basin of water, sniffing it up and blowing it out successively. The Syringe bath is taken by inserting into the nostril the discharge tube of a bulb syringe—a spray attachment is desirable—and forcing the water up so it will flow into the throat or out at the other nostril; this process is continued for several minutes, frequently removing the tube from one nostril to the other. The Syphon bath is administered by means of a syphon, one end of which is inserted into a basin of water placed above the head, while to the other end is attached a flexible tube with a discharge nozzle to be placed in the nostril. The air must be removed from the syphon before inserting the nozzle.

These baths may be of any agreeable temperature—tepid water is usually the most beneficial; a few grains of salt mixed with the water prevents the unpleasant smarting sensation which pure water may produce. Nose baths are beneficial in nearly all cases of catarrh, ozæna, cold in the head, and offensive discharges from the nostrils. Cold water, sniffed up the nose or thrown up with a syringe, will generally stop nosebleed.

30.—EAR BATH.

The spray or douche baths, applied either gently from a syringe or with force from a hydrant, are very useful in treating some chronic affections of the ear. Injections of warm water or warm soapsuds, when there are offensive discharges or accumulations of hardened wax, are often of service. Fomenting the ear with hot flannels or compresses, and afterward immersing it in a vessel of cool water, will sometimes relieve painful attacks of earache.

31.—WET GIRDLE.

For a wet girdle take of linen toweling or sheeting a double thickness from ten to fifteen inches wide and about

two yards long; use a double thickness of muslin or flannel, an inch or more wider and several inches longer than the linen girdle, for a dry wrapper. The linen should be dipped in tepid or cool water and wrung so as not to drip; it should then be placed around the body over the stomach, liver, and abdomen and immediately covered by the dry wrapper, the whole being kept in place by pins or tapes.

The wet girdle is a valuable application in derangements of the digestive organs, inflammation of the bowels, disordered liver, constipation, diarrhea, dysentery, piles, kidney disease, diseases of the ovaries, and congestion, ulceration, or displacement of the womb. In some cases only a part of the girdle need be wet, thus forming a kind of local pack. It draws out morbid excretions from the body, acts favorably upon the mesenteric and lymphatic glands, causes the lacteals and absorbents to act more energetically, relieves congestion or inflammation, and improves the circulation of the blood. Whenever the girdle is removed the part should be thoroughly cleansed with tepid or cool water. If chilliness follows its use, it should be wet only in front, or omitted entirely. After wearing the girdle a few days a bright rash will sometimes appear, which, if it does not interfere with sleep or become too painful, may be considered a favorable symptom. In case the irritation becomes too great the girdle should be omitted, but it must be left off gradually, so as to prevent the drying up of the rash too suddenly.

32.—CHEST JACKET.

This is made to fit the body like a double-breasted vest. There should be two, each made double, so that where they lap over in front there will be four thicknesses. The one to be wet should be made of linen, while the outside one should be of unbleached muslin or flannel. The covering should fit snugly about the neck and arms—if it has short sleeves it is all the better—and also about the lower part of the chest, so

as to exclude the air. The linen may be wet throughout, or only in front, according to circumstances. The chest jacket is useful in pneumonia, pleurisy, diseases of the heart, incipient consumption, bronchitis, affections of the throat and air-passages, and also in fevers.

33.—WET COMPRESS.

Take several thicknesses of old linen, the size depending upon the surface to be covered; dip them in tepid, cool, or cold water, press out the most of it, and apply to any part of the body where there is pain, heat, redness, or swelling. The wet cloth should be covered by several thicknesses of dry flannel or muslin, and should be changed as often as it becomes dry or hot. Compresses are very useful in treating boils, abscesses, bruises, sprains, injuries, dyspepsia, pleurisy, derangement of liver, and a variety of other ailments.

34.—WET BANDAGES.

These consist of two or three thicknesses of soft linen, and as many of muslin or flannel for a covering, made in size and form to fit that part of the body to which they are to be applied. They may be used upon any part, at any temperature, and are applied in a manner similar to the wet girdle. They are invaluable in cases of sore throat, croup, scarlet fever, diphtheria, inflammation of the larynx, bronchial tubes, or tonsils, in catarrh, and ulcerated mucous membranes, and a variety of local affections where there is pain or heat.

35.—WET HEAD CAPS.

Take two thicknesses of linen, three or four inches wide and long enough to extend around the head, sew together the ends and gather the upper edge into a crown piece, also of

two thicknesses, of a size to fit the wearer. This cap should be dipped in cool or cold water and worn upon the head when there is heat, congestion, or pain in that part. It should be usually covered by a dry muslin cap and renewed as often as it becomes dry or hot.

36.—WATER DRINKING.

Soft water as a drink is invaluable, whether considered from a hygienic or medical point of view. By its power as a solvent and absorbent, water is enabled to remove from the system those acrid poisons, effete matters, and noxious gases, which, if retained, become the causes of disease.

Water when drank is mostly absorbed in the stomach, the coats of this organ drinking it in as the thirsty earth drinks in the falling rain. As before stated water enters largely into the formation of every tissue of the body, and the drinking of pure soft water, will therefore produce wonderful changes in the human organism. By means of it the appetite is improved, and digestion aided; the kidneys are rendered more active, and through them impurities are worked out of the body; the perspiratory glands are aroused to action and throw out morbid matters through the skin; water drinking subdues morbid cravings, calms the nervous system, cools the heat of fever, relieves internal congestion, allays inflammation, purifies the blood, regulates the circulation, and aids nature in the various processes of nutrition, assimilation, and excretion.

Water, not too cold, if drank slowly, may be taken as freely as the thirst demands, either in health or in disease; persons overheated, or exhausted by exercise or by any other means, should sip it very slowly, and not very cold.

The best time for drinking water is half an hour before breakfast, or when the stomach is so nearly empty that it will be absorbed before the food is taken. Little or no drink should be taken during meals, as cold drinks lower the tem-

perature of the stomach, and any drink dilutes the digestive fluids and thus retards digestion. Persons subject to bad dreams, or any excitement during sleep, should avoid taking fluids in the after part of the day.

37.—WATER EMETICS.

Vomiting may be readily induced by drinking several goblets of warm water at intervals of from one to three minutes. Tickling the throat with the finger or with a feather, will often facilitate the process. The water dissolves the mucous slime, bile, and other offending materials in the stomach, and at the same time by rapidly distending this organ it is aroused to action, and the offending substances are ejected by vomiting. Very useful in cases of sick headache, nausea, or whenever it is desirable to cleanse the stomach. Very hot or very cold drinks will often arrest nausea.

38.—INJECTIONS.

The best instrument for giving injections to the bowels is the common elastic bulb syringe, so arranged that a quart or more of water may be injected without removing the tube.

An injection of warm, tepid, or cool water may be given at any time when a movement of the bowels is desired; it is well to inject a small quantity, say half a pint, at a temperature of 95°, and wait three or four minutes; then take water at 90°, and inject a pint; if no action is produced after waiting ten minutes, inject another pint at 80° and continue the process till a movement is secured. At the commencement of fevers or other acute diseases, it is well to thoroughly cleanse out the bowels with injections, giving two or three in succession, until all offending substances are removed, after which once a day or once in two days may be all that is necessary.

Tepid or cool injections are most effectual in relieving constipation, bleeding or pain in piles, diarrhea, dysentery, and

hemorrhoids. For leucorrhea, prolapsus, displacements, and for inflammation and ulceration of the vagina and womb, tepid or cool injections are very useful.

The bladder and urethra may be cleansed of catarrh or muco-purulent discharges by injections. A weak solution of nitrate of silver, acetic acid, or other astringent is sometimes required in these diseases, but should be used only by physicians who thoroughly understand the case and the strength of the material necessary to use.

39.—HAND RUBBINGS.

Great benefit is often derived from a thorough rubbing of the body with the dry hand. A towel, sponge, or brush may be used, but the hand alone is better. The bather, if able, should stand while the attendant rubs vigorously the entire surface of the body from ten to twenty minutes, or until the skin is flushed, and the surface thoroughly warm. Patients, too feeble to stand, may be rubbed for half an hour or more while lying in bed, the hand being introduced beneath the coverings. This treatment is especially adapted to the feeble and bed-ridden, who can not endure much exercise or the use of the various water applications.

40.—SEA BATHING.

Sea bathing, as a luxury for the healthy and a remedy for the invalid, can be traced to a very remote period of time. Many of the benefits supposed to be derived from it, however, are due to change of scene and occupation, freedom from the cares and fatigues of business, pleasant society, breathing the fresh sea air, and an increase of physical exercise.

The advantages of sea bathing, are: First, sea water is very stimulating, induces free circulation at the surface, and thus secures a speedy reaction. Second, the particles of salt adhering to the skin, aided by the friction of the clothing,

keep up a constant irritation or stimulation of the surface, and lessen the liabilty to take cold after a bath. Third, there is generally active exercise and a good degree of mental excitement and exhilaration, when a dozen or more go hand in hand into the sea, with the breakers dashing over and around them, and under such circumstances the necessary reaction is readily secured.

As a general rule, however, invalids should bathe in the open sea only by advice of a physician, as the very advantages we have named may become, to them, elements of injury; but for the sponge bath, rubbing sheet, or half bath, sea water may often be used with good results.

The general rules for bathing previously given are as applicable to sea bathing as to other baths. The following hints, however, should be borne in mind by sea bathers.

Do not resort to sea bathing when the body is exhausted by fatigue, or by a previous night's dissipation, or when in a profuse perspiration. Do not remain long exposed to the air after disrobing, nor stand shivering and dreading, but at once plunge the whole body under water, first thoroughly wetting the head and face. Do not remain quiet or passive in the water—especially should this be observed by invalids—swimming, splashing, and continually exercising, increases the respiration and quickens the circulation, thereby securing a greater flow of blood to the surface and a more salutary warmth.

On first entering the water, a temporary chill may be felt, occasioned by the contraction of the surface capillaries which drives the blood to the interior parts; it will soon be returned, however, by the accelerated action of the heart, and in time this reaction will be overcome and a second chill will follow, but bathers, especially invalids, should leave the water before this second chill comes on.

Do not allow the body to be long exposed to the air after leaving the water. Invalids should be immediately covered with a flannel blanket or wrapper. Active exercise after this

bath, as in the case of others, increases its good effects and wards off injuries which might otherwise ensue.

Persons from the interior, visiting the sea side, should provide extra under garments to compensate for the cooler temperature of the sea air. The robust and vigorous may bathe before breakfast, but invalids should take the middle of the day when the sun is shining, and if the head is well wet and left uncovered there is much less liability to headache.

Invalids should begin a course of sea bathing with the sponge or towel bath, the wet sheet, the hip and half bath, with the water at an agreeable temperature. When they first enter the open sea, one or two immersions will be sufficient; the time may be gradually increased to four or five minutes. The majority of bathers should not remain in more than ten or fifteen minutes.

Children should be initiated into sea bathing gradually, or in the manner prescribed for invalids, and never forcibly taken into the sea when their dread of it can not be overcome. I have known serious and life-long injuries to be engendered by parents forcibly taking their children into the water, when, by their screams and protestations, it was evident that their dread of it was occasioned by fear. Though no immediate injury may be apparent, yet in many cases convulsions, congestion, water on the brain, or some other disease producing death, subsequently occurs from this cause alone.

Sea bathing should be carefully avoided by the aged, by very young and feeble children, by those whose vital powers are too feeble to produce reaction, and by pregnant or nursing women; also by those suffering from hemorrhage of the lungs, consumption, aploplectic conditions, acute gout or rheumatism, local or internal inflammations, febrile diseases, heart disease, a very sensitive skin, certain morbid conditions of the blood, and extreme dread of the sea.

41.—AIR BATH.

This is very beneficial both in sickness and in health. It consists in exposing the person to the air either with or with out a thin covering—it may be taken morning or evening, but the best results follow when it is taken in the middle of the day, in a large sunny room, the bather rubbing his body and walking or leaping vigorously all the while—active exercise, and no lengthened exposure to a draft, are essential features of this bath. Feeble persons should take the air bath only in a warm room. Patients confined to the bed are greatly benefited by the bed coverings being lifted gently several times a day, allowing the air to circulate freely; nervous restlessness is often most effectually soothed in this way.

Wakefulness may often be overcome and sleep promoted by an air bath taken in the night, the bed being at the same time thrown open to the air. Persons unaccustomed to air baths should initiate themselves into the practice very gradually and with great caution.

42.—SUN BATH.

All of life, of motion, and of beauty that the earth possesses is derived from the sun. The existence and perfection of all organic life is dependent upon the heat and light of this luminary. The carbonic acid which is absorbed by the foliage of trees and plants for food, can be used only after the sunlight has liberated the oxygen, leaving the carbon to build up the plant tissues. This necessity for light is observed in house plants, which turn all their leaves toward the window by which the light enters. If you place a healthy growing plant in the dark its leaves turn pale, its flowers fade, it droops and dies. Sunlight is essential to chemical combinations and decomposition; mix chlorine and hydrogen in the dark and no chemical change follows, but admit the sun's rays and they unite at once, and with a loud explosion.

Sunlight is alike necessary to the perfection of animal life. Fishes found in the waters of dark caves have no eyes, and are imperfect in every way. The tadpole kept in the dark will never develop into a frog. The human race too is subject to the same law. Night laborers are, with rare exceptions, sickly and short-lived. The average life of miners is less than half that of people whose occupations allow them a full share of sunlight. The children of miners, and of people who live in dark alleys, basements, and factories, are generally pale and sickly, liable to rickets, swelling of the bones, scrofula, and malignant diseases. In the deep gorges of the Alpine mountains where the sun's rays never penetrate, are born a people noted for deformity and idiocy; they present enormous necks swollen by goitre, enlarged abdomens, spindle legs, and crooked backs.

People often exclude sunlight from their dwellings by shutters, curtains, or too dense shade trees, thus engendering in their children crooked spines, weak bowels, decayed teeth, soft and delicate muscles, and deranged nervous organizations in place of the sprightliness, the plumpness, and the rosy hue of health. Those who are so reared in the shade, though among the wealthy, are almost as liable to suffer from epidemics as are the poor and debauched. It has been found that in the hospitals of Russia four times as many persons recover in rooms where sunlight is freely admitted, as in those from which it is partially or wholly excluded. In cities visited by cholera, the greater number of deaths occur upon the north sides of narrow streets where the direct rays of the sun seldom or never fall. Indoor seclusion and absence of sunlight, is one great cause of the sickly condition of American women. Family rooms should always be situated on the sunny side of the house.

Sunshine is essential for ripening the air we breathe as well as the food we eat. Not only should we live in sunshine, but every pore of the skin being a little mouth wanting water and air, wants and should have the sunshine too. Animals

are exposed alike to the showers, the dews, the fresh air, and the sunshine. The human body needs these elements of health as well, but man's clothing and his dwellings shut them out to a great extent, and for this reason the exposure of the entire body for a short time daily to the direct rays of the sun, in some place protected from cold air, is very beneficial even for the healthy, and especially so for invalids. If the sun bath were regularly and frequently taken digestion and assimilation would be more complete, the skin would become firmer and tougher, the muscles more solid and elastic, the nerves less irritable, the circulation more regular, and all the physiological, chemical, and vital changes more effectually carried on.

43.—DIET.

The subject of diet, though little understood, is worthy of profound study. People eat because they are hungry, never stopping to consider why this hunger! The body is formed from food; the processes of life occasion constant waste; hunger is the demand of the system for a fresh supply of material to renew this waste. In childhood, food for growth as well as waste is demanded; hence the keen relish with which children eat. These truths being fully realized, it is easy to understand what an influence food exerts in preserving health, and also in producing and removing disease.

Food, both in quality and quantity, should be precisely adapted to the wants of the system; other than this causes disturbance, and mars the harmony of the whole being. Invalids should carefully avoid the following list of articles: Pork, fats, salted and smoked meats and fish, lobsters, rich soups, pickles, salads, and raw vegetables of every kind; vinegar, mustard, pepper, spices, and all condiments; cheese, rich pastry and puddings, nuts, strong tea, coffee, distilled or fermented liquors, tobacco, and whatever else impairs or impedes digestion.

For information regarding the most wholesome food, and the best methods of preparing it, both for the healthy and for invalids, the reader is referred to the "Hygienic Cook Book" by Mrs. M. M. Jones.

44.—MOVEMENTS.

Exercise is necessary for the health, happiness, and perfect development of every human being. Persons in health may obtain this by out-door sports, gymnastics, and daily occupations. The Movement-cure is a system of exercises adapted to invalids and those of sedentary habits. They are prescribed by a physician, are based upon a knowledge of anatomy, physiology, and disease, and are executed by trained operators.

Movements are classed as hygienic and medical. These classes are divided into active, passive, and combined. The active, are executed by the patient; passive, by the operator; combined, by the two working together. They are local or general, according as they are applied to a part or the whole of the body.

The effects of the movements are to relieve pain, improve digestion and nutrition, increase and regulate the circulation, force out effete and waste material from the tissues, increase respiration—thus more thoroughly oxygenating the blood—regulate the temperature of the body, promote absorption, secretion, and excretion, check excessive morbid discharges, soothe and quiet the nerves, develop weak muscles, restore paralyzed limbs, straighten curved spines, overcome deformity or contraction of muscles, induce proper action in the lungs, heart, liver, and bowels, and secure a harmonious development of the whole body. They are adapted to all cases of chronic disease and some acute.

TREATMENT OF DISEASE.

Twelve years' experience in treating the sick, during which time thousands of patients afflicted with every phase of disease have been under my care, has convinced me that water as a remedial agent is all-important. My notes of practice both in institutions and in private, corroborate this. I have also had opportunities for extended observation of the methods of treatment as pursued in hospitals by all the different schools of medical practice, and I am fully satisfied that water—combined with other natural agents—possesses power to remove the causes of disease and restore the system to healthy action, far exceeding any and all other substances in use.

New theories of the nature of disease, new systems of medical practice, and new remedies for treating the sick are continually being developed, each in a measure contradicting and displacing those of previous periods. Thirty years ago antimony, calomel, and the lancet were the chief agents in the treatment of fevers and inflammatory diseases; now they are almost obsolete in these cases. Almost every year new remedies are being brought into use, and old ones which had heretofore been considered indispensable are discarded as useless; and so it will be till the healing art is placed on a true basis.

With regard to water and hygiene, they not only maintain their first position but have been gradually growing in public favor. More than a century ago Dr. James Currie published a book on The Treatment of Fevers by Cold Water, but he at that time stood almost alone. Now, many of the leading minds in the medical profession appreciate its value and adopt it in their practice, as the following quotations from well-known physicians will testify:

"As we place more confidence in Nature and less in the preparations of the apothecary, mortality diminishes." "Hy-

giene is of far more value in the treatment of disease than drugs." "I have cured granulations of the eyes by Hygienic treatment after all kinds of drugs had failed."—*Prof. Parker.*

"Water is the best diaphoretic we have."—*Prof. Carson.*

"We are not acquainted with any agents that will cure consumption; we must rely upon Hygiene." "A hundred different plans have been tried for the cure of cholera; I think that hereafter I shall leave my patients almost entirely to Nature, as I have seen patients abandoned to die and left to Nature recover, while those who were treated died." "A sponge bath will do more to quiet restless patients than any anodyne."—*Prof. Clark.*

"Cold affusion is the best antidote for narcotic poison." "The continued application of cold water has more power to prevent inflammation than any other remedy;" "the application of water to the external surface of the abdomen is of great importance and value in the treatment of dysentery; I have cured adults by this means alone." "Water is equal in efficacy, as a diuretic, to all other diuretics combined;" "water is the best febrifuge we have."—*Dr. Gilman.*

"The principles of the Water-cure treatment are founded in nature and truth; we have in our power a new and most efficacious agent for the alleviation and cure of disease in various forms, and, in proper hands, as safe as it is effectual. I should be no friend to humanity if I did not give my testimony in its favor."—*Sir Charles Scudamore, M. D., F. R. S.*

"Hydropathy more than doubles our power of doing good. No opposition, come from what quarter it may, can possibly prevent its progress, and its taking firm root. It is like truth, not to be subverted."—*Herbert Mayo, Senior, Surgeon of Middlesex Hospital.*

"Water-cure is founded upon a rock, and the winds and waves of persecution will in vain assail it."—*Dr. Balbirnie.*

"If men knew how to use water so as to elicit all the remedial results it is capable of producing, it would be worth all their other remedies put together."—*Dr. Macartney, Lecturer at Trinity College, Dublin*, 1836.

A vast amount of testimony similar to the foregoing might be given, but we will only add some quotations from a paper on "Treatment of Typhoid Fever," read before the New York Academy of Medicine, October 15, 1868, by W. Neftel, M. D.: "It is not necessary to dwell long on the treatment of typhoid fever. We know that the degree of its intensity and danger to life depends on the high temperature. Hence every means of diminishing this must be resorted to.

"For regulating the temperature of the body with mathematical precision, we possess but one means—cold, in its various forms, and methodically applied.

"My first acquaintance with the use of water in diseases was during the Crimean War in 1853. I was then attached as a physician to the Imperial Russian Guard, where a murderous epidemic of typhus fever prevailed, with a most distressing figure of mortality, resisting all our efforts to subdue it by every known method of treatment. Following then only the instinct of the patients, and watching closely the immediate effect of cold water, I soon began to appreciate its beneficial influence upon the course and termination of the disease, and commenced treating all the cases with cold sponging and affusions. The result surpassed my hopes, and was far better than that obtained by any other method. I was myself attacked by the disease, and was saved from death only by my own mode of treatment. But still my treatment then was purely empirical and symptomatic.

"In 1861 Brand published his first monograph on the treatment of typhoid fever with water. Jürgensen and Liebermeister confirmed his method by excellent scientific investigations; and in the large hospitals of St. Petersburg this plan of treatment has been tested on a wide scale, and with excellent results.

"Brand's principal rule is never to allow the temperature to rise above 103·1° F.; and as soon as it comes to it, immediately to cool the patient according to the degree wanted. The mildest degree of cooling is attained by sponging the body with cold water, or by keeping the patient continually in a wet sheet, or again by a full tepid bath, and especially with cold water gradually added to it; the next degree by a tepid half bath with cold affusions; the highest degree by cold affusions, shower bath, or cold bath with cold affusions.

"The treatment is as follows: Brand gives his patients a tepid half bath with cold affusions four or six times per day. As the greatest heat occurs from 10 to 12 A.M., and from 4 to 6 P.M., a bath is given just before 10 and before 4 o'clock, and besides, at every other time when the thermometer shows 103·1° F. The patient is left in the bath from five to fifteen minutes. The cold bath diminishes the temperature of the body from 1·8° to 5·4° F., according to its intensity and duration. In order that the evaporation of water should continue to produce cold, the patient is not dried after the baths, between which he is occasionally sponged over. A wet cloth is laid on the head, and another on the chest and abdomen, so that the continual refrigeration is kept up on one-third of the body. Every quarter of an hour, if the patient is not asleep, he is offered a little cold water to drink, and every three hours, nourishing food in a fluid state. The room is kept well ventilated, and stimulants are avoided, unless a collapse should take place; that, however, does not occur under this treatment.

"Dr. Brand says, 'The effect of this treatment is so wonderful, that those familiar with typhoid patients will not recognize them. By keeping the temperature below 103·1° F., the exacerbations are avoided and the fever kept in a continuous remission. The patients are *never unconscious*, *never delirious;* the tongue always remains *moist* and *clean;* the bronchial catarrh is *very slight;* so is the diarrhea, if any at all. There is *no tympanites*, *no hemorrhage*, *no complica-*

tion, and we have every reason to believe that the *intestinal ulcerations do not occur at all.* The patients, aided by some one, have strength to walk to their bath; they have a good appetite, and very quiet, refreshing sleep. On coming out of the bath, they generally eat and take a sleep. Under this treatment the course of the typhoid fever is very *mild* and *short*, the convalescence *very rapid*, and the mortality *none whatever*.'

"From my own experience, I may say, that a great number of patients, treated by myself according to this method, have *all recovered without exception.* In this city I had a patient, whose morning temperature once reached even 106·34° F.—a case absolutely fatal under every other treatment; she is nevertheless recovering.

"In the course of the fever I occasionally give injections of cold water, which, as I have observed, reduce the heat sometimes by a whole degree, to the greatest comfort of the patient. For all the rest I strictly adhere to Brand's plan of treatment."

This statement of the method of treating typhoid fever by Dr. Neftel and Dr. Brand, so fully corroborates my own experience, that I take pleasure in giving it a place in this little book. Water and other Hygienic agents when skillfully applied, are equally efficacious in the treatment of every form of fever and inflammation. The causes of disease, whether acute or chronic, are more effectually removed by these agents than by any other means; health is also restored with far less injury to the human system.

I earnestly believe that the day is not far distant when water, hygiene, and obedience to physical law will be deemed as essential and prove as effectual for the regeneration of mankind, physically, as faith, baptism, and obedience to moral law are for his regeneration spiritually.